

REMARKS

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and the following remarks.

Claims 29-31, 33-38 and 41 were pending when examined.

Claim 29 is amended to replace “the insert member” with “the metal gears”, as suggested by the Examiner.

Support for new claims 42-50 can be found in the working examples in the specification (see e.g., page 20, line 31 – page 26, line 12, and Table 1).

I. Claim Rejection Under 35 U.S.C. § 112

The Examiner rejects claims 29-41 under 35 U.S.C. § 112, second paragraph, as being indefinite. The Examiner states that the limitation “the insert member” in line 9 of claim 29 lacks antecedent basis. Claim 29 is amended to recite “the metal gears”, rendering the rejection moot.

II. Claim Rejections Under 35 U.S.C. § 103

The Examiner rejects claims 29-31 and 34-41 under 35 U.S.C. §103(a) as being unpatentable over JP2002-248649 in view of JP1-310924, JP1-69314, JP 7-60556 and Kasai et al. (US 5,109,052) (“Kasai”). Claims 39 and 40 have already been cancelled, rendering their rejection moot. As to the remaining claims, Applicants respectfully traverse the rejection.

The use of a polymer alloy in which a polyphenylene phase is dispersed in a matrix phase of an aliphatic polyamide (including nylon) is specifically suitable for the coating of metal gears. Consequently, the resin-coated metal gears obtain excellent strength, rigidity, accuracy, impact resistance, fatigue resistance, noise reducing properties and wear resistance, and do not cause resin crack, even after molding or when used without lubrication.

JP 2002-248649 discloses the use of nylon 66 but, as acknowledged by the Examiner, does not teach or suggest the use of a resin comprising a polymer alloy in which a polyphenylene phase is dispersed in a matrix phase of an aliphatic polyamide (see Office Action, page 5, item 14). However, the Examiner asserts that Kasai cures this deficiency.

One of ordinary skill in the art would have had no reason or rationale to combine Kasai with JP2002-248649, JP1-310924, JP1-69314 and JP 7-60556. Therefore, Kasai does not cure the deficiencies identified above with respect to claim 29.

In addition, JP 2002-248649 does not teach or suggest “**a preheating step of heating the metal gears to a predetermined temperature within a range of from 40°C to a melt injection temperature of the resin and a mold for molding to a predetermined temperature within a range of from 40°C to (melt injection temperature of the resin - 50°C).**” Rather, the reference only teaches to preheat a mold, and does not teach or suggest the independent temperature control between the metal gears and the mold in the preheating step, as claimed.

Moreover, the combination of the claimed resin and the preheating of both the metal gears and the mold for molding provides unexpected and superior advantages over the art. For instance, in Example 1, the insert member was 230°C and the mold temperature was 80°C, and the molding that was obtained generated no resin cracks even after seven days at room temperature. On the other hand, in Comparative Example 1, the insert member was 20°C, which is below the claimed predetermined temperature range of from 40°C, and resin crack occurred at the time the mold was taken out after molding. Similarly, in Comparative Example 2, where the insert member was 230°C, and the mold temperature was 20°C, which is below the claimed predetermined temperature of from 40°C, resin crack occurred at the time the mold was taken out after molding. See specification at page 24, lines 3-17, and Table 1. Accordingly, the claimed resin, in combination with the preheating step, provides unexpected and superior results in terms of a molding having no resin crack.

It should be noted that independent control of a preheating temperature between the metal gears and the mold is important. Thus, the combination of using the polymer alloy and the independent temperature control between the metal gears and the mold will effectively prevent resin crack, as the molding does not generate resin crack in an air atmosphere of a temperature range of from -40°C to 200°C.

In addition, new claim 42 further defines the resin comprising a polymer alloy in which a polyphenylene phase is dispersed in a matrix phase of an aliphatic polyamide to be Noryl GTX, and new claims 43-50 further define the Noryl GTX. The references do not teach or suggest these features.

As the references do not teach or suggest all of the features of claim 29, and the method of claim 29 shows unexpected results, claim 29 would not have been rendered obvious by the references. Claims 30, 31, 34-38 and 41, and new claims 42-50 depend directly or indirectly from claim 29, and thus also would not have been obvious over the references.

Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

The Examiner also rejects claim 33 under 35 U.S.C. § 103(a) as being unpatentable over JP 2002-248649 in view of JP 1-310924, JP 1-69314, JP 7-60556 and Kasai, as applied to claim 29, and further in view of Kitahata et al. Applicants respectfully traverse the rejection.

The arguments above regarding the references are applicable to this rejection. As discussed above, claim 29 would not have been obvious over the references. Claim 33 depends from claim 29, and thus also would not have been obvious over the references. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

III. Conclusion

For these reasons, Applicants take the position that the presently claimed invention is clearly patentable over the applied references.

Therefore, in view of the foregoing amendments and remarks, it is submitted that the rejections set forth by the Examiner have been overcome, and that the application is in condition for allowance. Such allowance is solicited.

Respectfully submitted,

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November 18, 2009